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Applications  
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substances identified in English-, French-, German-,  
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availability of new fully-indexed citations  
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|----------------------|------------|---------|
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| COST IN U.S. DOLLARS | SINCE FILE | TOTAL   |
|                      | ENTRY      | SESSION |
| FULL ESTIMATED COST  | 0.21       | 0.21    |

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FILE COVERS 1907 - 9 Dec 2008 VOL 149 ISS 24  
 FILE LAST UPDATED: 8 Dec 2008 (20081208/ED)

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=> s (direct) (l) esterif? (l) (pentaerythritol or propanediol)
697573 DIRECT
9675 DIRECTS
706136 DIRECT
      (DIRECT OR DIRECTS)
139222 ESTERIF?
30048 PENTAERYTHRITOL
136 PENTAERYTHRITOLS
30063 PENTAERYTHRITOL
      (PENTAERYTHRITOL OR PENTAERYTHRITOLS)
38977 PROPANEDIOL
874 PROPANEDIOLS
39229 PROPANEDIOL
      (PROPANEDIOL OR PROPANEDIOLS)
L1      44 (DIRECT) (L) ESTERIF? (L) (PENTAERYTHRITOL OR PROPANEDIOL)

=> s l1 and (inert (3w) gas)
155326 INERT
642 INERTS
155796 INERT
      (INERT OR INERTS)
1719203 GAS
562922 GASES
1915479 GAS
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(GAS OR GASES)

62759 INERT (3W) GAS

L2 2 L1 AND (INERT (3W) GAS)

=&gt; d l2 1-2 ibib abs

L2 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:1466688 CAPLUS

TITLE: Poly(1,2-propanediol terephthalate) and its copolyester and the preparation method

INVENTOR(S): Li, Chuncheng; Yin, Ming; Zhang, Dong; Guan, Guohu; Zhang, Xinzhi; Fang, Shibi

PATENT ASSIGNEE(S): Institute of Chemistry, Chinese Academy of Sciences, Peop. Rep. China

SOURCE: Faming Zhuanli Shengqing Gongkai Shuomingshu

CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO.  | DATE     |
|------------------------|------|----------|------------------|----------|
| -----                  | ---- | -----    | -----            | -----    |
| CN 101314637           | A    | 20081203 | CN 2007-10099890 | 20070531 |
| PRIORITY APPLN. INFO.: |      |          | CN 2007-10099890 | 20070531 |

AB The high-mol.-weight poly(1,2-propanediol terephthalate) and its copolyester, with the structure on the top of page 2, can be prepared by direct esterification or transesterification. The direct esterification method comprises adding dibasic acid monomer and dibasic alc. monomer at a molar ratio of 1:1-3 into a reactor under the protection of inert gas, carrying out esterification with or without esterification catalyst at 240-280°C, and carrying out condensation polymerization in the presence of condensation polymerization catalyst at 5-200 Pa to obtain the poly(1,2-propanediol terephthalate) and its copolyester. The transesterification method comprises adding dimethyl ester monomer and dibasic alc. monomer at a molar ratio of 1:1-3 into a reactor under the protection of inert gas, carrying out transesterification in the presence of transesterification catalyst at 120-240°C, adding 0-2 weight parts of additive, and carrying out condensation polymerization in the presence of condensation polymerization catalyst at 240-280°C and 5-200 Pa to obtain the poly(1,2-propanediol terephthalate) and its copolyester. The poly(1,2-propanediol terephthalate) and its copolyester has good performance, and can be widely applied to the fields of textiles, carpet fibers, thin films, engineering plastics, and packaging materials.

L2 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1945:12815 CAPLUS

DOCUMENT NUMBER: 39:12815

ORIGINAL REFERENCE NO.: 39:1998g-i

TITLE: Esterification of unsaturated fat acids

AUTHOR(S): Konen, J. C.; Clocker, E. T.; Cox, R. P.

SOURCE: Oil and Soap (Chicago) (1945), 22, 57-60

CODEN: OISOA4; ISSN: 0095-9510

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB The direct reaction of fatty acids, having a long chain, with an alc. gives no reaction unless a strong acid is added as a catalyst. The rate and degree of esterification can be improved with polyhydric alcs. by blowing an inert gas through the mixture at some optimum temperature to remove water, but operating under reduced pressure is the most efficient method. The best method is as follows: heat under vacuum fatty acids and the theoretical amount, plus 5%, of alcs. at 450°F. Bubble steam, inert gas or SO<sub>2</sub> rapidly to provide agitation and carry off water, using a condenser and an air-cooled column to condense and return vaporized alcs. Polyhydric alc. esters of linseed and soybean acids were prepared, also pentaerythritol esters of linseed oil, soybean and castor oil. All the acids reacted similarly to give an acid number around 5 in 5-8 hrs. The testing of the esters in varnishes is being carried out. All the synthetic esters show an improvement in bodying speed over the corresponding glycerol ester.

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|                                            |                  |               |
|--------------------------------------------|------------------|---------------|
| COST IN U.S. DOLLARS                       | SINCE FILE ENTRY | TOTAL SESSION |
| FULL ESTIMATED COST                        | 20.46            | 20.67         |
| DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS) | SINCE FILE ENTRY | TOTAL SESSION |
| CA SUBSCRIBER PRICE                        | -1.60            | -1.60         |

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L1 44 S (DIRECT) (L) ESTERIF? (L) (PENTAERYTHRITOL OR PROPANEDIOL)  
 L2 2 S L1 AND (INERT (3W) GAS)

FILE 'STNGUIDE' ENTERED AT 13:11:36 ON 09 DEC 2008

=&gt; s l1 not l2

6 DIRECT  
 0 ESTERIF?  
 0 (DIRECT) (L) ESTERIF? (L) (PENTAERYTHRITOL OR PROPANEDIOL)  
 6 DIRECT  
 0 ESTERIF?  
 0 (DIRECT) (L) ESTERIF? (L) (PENTAERYTHRITOL OR PROPANEDIOL)  
 2 INERT  
 8 GAS  
 3 GASES  
 10 GAS

(GAS OR GASES)  
 0 INERT (3W) GAS  
 0 L1 NOT L2

L3

=> file caplus  
 COST IN U.S. DOLLARS

| SINCE FILE | TOTAL   |
|------------|---------|
| ENTRY      | SESSION |
| 0.24       | 20.91   |

FULL ESTIMATED COST

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

| SINCE FILE | TOTAL   |
|------------|---------|
| ENTRY      | SESSION |
| 0.00       | -1.60   |

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FILE COVERS 1907 - 9 Dec 2008 VOL 149 ISS 24  
 FILE LAST UPDATED: 8 Dec 2008 (20081208/ED)

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=> s l1 not l2  
 L4 42 L1 NOT L2

=> d l4 1-11 ibib abs

L4 ANSWER 1 OF 42 CAPLUS COPYRIGHT 2008 ACS ON STN  
 ACCESSION NUMBER: 2008:383301 CAPLUS  
 TITLE: Oxidation of glycerol and propanediols in methanol over heterogeneous gold catalysts  
 AUTHOR(S): Taarning, Esben; Madsen, Anders Theilgaard; Marchetti, Jorge Mario; Egeblad, Kresten; Christensen, Claus Hviid  
 CORPORATE SOURCE: Center for Sustainable and Green Chemistry, Department of Chemistry, Technical University of Denmark, Lyngby, DK-2800, Den.  
 SOURCE: Green Chemistry (2008), 10(4), 408-414  
 CODEN: GRCHFJ; ISSN: 1463-9262

PUBLISHER: Royal Society of Chemistry  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Aerobic oxidation of glycerol over metal oxide supported gold nanoparticles in methanol results in the formation of di-Me mesoxalate in selectivities up to 89% at full conversion. The oxidative esterification takes place in methanol, acting both as solvent and reactant, and in the presence of base. Thus, it constitutes a direct transformation of the glycerol byproduct phase from biodiesel production or from glycerol obtained e.g. by fermentation. Au/TiO<sub>2</sub> and Au/Fe<sub>2</sub>O<sub>3</sub> was found to have similar catalytic activity, whereas Au/C was inactive. 1,2-Propanediol was oxidized to Me lactate with a selectivity of 72% at full conversion, while 1,3-propanediol yielded Me 3-hydroxypropionate with 90% selectivity at 94% conversion. Me 3-hydroxypropionate can be easily converted into Me acrylate, which is then a green polymer building block.

REFERENCE COUNT: 46 THERE ARE 46 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 2 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:1343885 CAPLUS  
TITLE: Synthesis and characterization of pentaerythritol tetramethylacrylate  
AUTHOR(S): Wei, Yu-li; Wang, Yun-pu; Chang, Yue; Wang, Bing  
CORPORATE SOURCE: Institute of Polymer, Key Laboratory of Polymer Materials of Gansu Province, Northwest Normal University, Lanzhou, Gansu, 730070, Peop. Rep. China  
SOURCE: Xibei Shifan Daxue Xuebao, Ziran Kexueban (2007), 43(5), 63-66  
CODEN: XDXKEH; ISSN: 1001-988X  
PUBLISHER: Xibei Shifan Daxue Xuebao Bianjibu  
DOCUMENT TYPE: Journal  
LANGUAGE: Chinese

AB Pentaerythritol tetramethylacrylate is synthesized by direct esterification, and the effects on the reaction of esterification are studied. The optimum reaction conditions are discussed: the molar of pentaerythritol to methacrylic acid is 1:8, the percent of p-toluene sulfonic acid as catalyst, dicyclohexylcarbodiimide as dehydrant, hydroquinone as antipolymerizer are 6.0%, 1.0%, 2.0%, resp. (according to the mass of pentaerythritol and methacrylic acid), and the yield of reaction can reached 80% when the mixture is stirred at 80.apprx.90°C for 8 h. The water-carrying reagent of traditional esterification such as benzene or methylbenzene is discarded. This synthetic methodol. is little toxicity, little pollution and environmental friendly.

L4 ANSWER 3 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:754605 CAPLUS  
DOCUMENT NUMBER: 147:118625  
TITLE: Preparation of polyol (meth)acrylates by esterification under control of water content  
INVENTOR(S): Wakayama, Toshiyuki; Kimura, Koji; Yoshikawa, Masayoshi; Miho, Akira  
PATENT ASSIGNEE(S): Toa Gosei Chemical Industry Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 13pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO. | DATE     |
|------------------------|------|----------|-----------------|----------|
| JP 2007176881          | A    | 20070712 | JP 2005-379414  | 20051228 |
| PRIORITY APPLN. INFO.: |      |          | JP 2005-379414  | 20051228 |

AB Title (meth)acrylates are prepared by esterification of (meth)acrylic acid with polyols having 2-4 alc. OH groups, wherein water content in the reaction mixture is controlled at ≤6% based on total amount of components other than organic solvents of the reaction mixture until reaction rate reaches 80%. This method gives the (meth)acrylates having various predetd. viscosity in high yields because the reaction mixture is clearly separated into upper organic layer and lower aqueous layer. Thus, a mixture of ditrimethylolpropane, acrylic acid, toluene, MeSO<sub>3</sub>H, PH(OH)<sub>2</sub>, and CuCl<sub>2</sub> was heated at 94° and 53 kPa while removing H<sub>2</sub>O to maintain H<sub>2</sub>O content 4-5.0% for 360 min to give acrylate ester having viscosity 1230 mPa.s.

L4 ANSWER 4 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:728860 CAPLUS  
DOCUMENT NUMBER: 147:118981  
TITLE: Continuous manufacture of poly(trimethylene terephthalate)  
INVENTOR(S): Eng, John Harvey; Blum, Emily A.; Green, Daniel Albert; Giardino, Carl J.; Parrish, Gene; Trotter, Robert E.; Wilson, Gary J.  
PATENT ASSIGNEE(S): E. I. Du Pont de Nemours and Company, USA  
SOURCE: PCT Int. Appl., 29pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO.     | KIND                                                                                                                                                                                                                                                                                                                                                                                                                                   | DATE     | APPLICATION NO. | DATE     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|----------|
| WO 2007075991  | A2                                                                                                                                                                                                                                                                                                                                                                                                                                     | 20070705 | WO 2006-US48980 | 20061221 |
| WO 2007075991  | A3                                                                                                                                                                                                                                                                                                                                                                                                                                     | 20070823 |                 |          |
| W:             | AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW |          |                 |          |
| RW:            | AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA                                                                                                                                 |          |                 |          |
| US 20070191581 | A1                                                                                                                                                                                                                                                                                                                                                                                                                                     | 20070816 | US 2006-638978  | 20061214 |
| CA 2632699     | A1                                                                                                                                                                                                                                                                                                                                                                                                                                     | 20070705 | CA 2006-2632699 | 20061221 |
| EP 1971629     | A2                                                                                                                                                                                                                                                                                                                                                                                                                                     | 20080924 | EP 2006-848012  | 20061221 |
| R:             | AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR                                                                                                                                                                                                                                                                                                             |          |                 |          |
| IN 2008DN04819 | A                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20080815 | IN 2008-DN4819  | 20080604 |

MX 200807924 A 20080627 MX 2008-7924 20080618  
 KR 2008079689 A 20080901 KR 2008-717523 20080718  
 PRIORITY APPLN. INFO.: US 2005-752481P P 20051221  
 WO 2006-US48980 W 20061221

AB The continuous process for production of poly(trimethylene terephthalate) comprises continuously producing poly(trimethylene terephthalate) oligomer by ester exchange reaction of di-Me terephthalate with excess 1,3-propanediol at an elevated temperature or direct esterification reaction of terephthalic acid with excess 1,3-propanediol at an elevated temperature; continuously precondensing the poly(trimethylene terephthalate) oligomer to form a poly(trimethylene terephthalate) prepolymer and gaseous byproducts comprising volatilized byproduct 1,3-propanediol; and (c) continuously polymerizing the poly(trimethylene terephthalate) prepolymer to form higher mol. weight poly(trimethylene terephthalate) and addnl. gaseous byproducts comprising volatilized byproduct 1,3-propanediol, wherein gaseous 1,3-propanediol byproduct is condensed in a condenser, the total amount of any trimethylene terephthalate cyclic dimer and poly(trimethylene terephthalate) in the condensed byproduct 1,3-propanediol is adjusted, and a portion of the condensed byproduct is recycled to the condenser while another portion is recycled back into the process.

L4 ANSWER 5 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:728842 CAPLUS

DOCUMENT NUMBER: 147:118980

TITLE: Continuous process for manufacturing poly(trimethylene terephthalate)

INVENTOR(S): Eng, John Harvey; Blum, Emily A.; Green, Daniel Albert; Parrish, Gene; Trotter, Robert E.; Wilson, Gary J.

PATENT ASSIGNEE(S): E. I. Du Pont de Nemours and Company, USA

SOURCE: PCT Int. Appl., 27pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.                                                                                                                                                                                                                                                                                                                                                                                                                            | KIND | DATE     | APPLICATION NO. | DATE     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------|-----------------|----------|
| WO 2007075990                                                                                                                                                                                                                                                                                                                                                                                                                         | A2   | 20070705 | WO 2006-US48979 | 20061221 |
| WO 2007075990                                                                                                                                                                                                                                                                                                                                                                                                                         | A3   | 20070823 |                 |          |
| W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW |      |          |                 |          |
| RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA                                                                                                                            |      |          |                 |          |
| US 20070249857                                                                                                                                                                                                                                                                                                                                                                                                                        | A1   | 20071025 | US 2006-638917  | 20061214 |
| CA 2631350                                                                                                                                                                                                                                                                                                                                                                                                                            | A1   | 20070705 | CA 2006-2631350 | 20061221 |
| EP 1971630                                                                                                                                                                                                                                                                                                                                                                                                                            | A2   | 20080924 | EP 2006-848011  | 20061221 |



R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,  
 IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR  
 IN 2008DN04820 A 20080815 IN 2008-DN4820 20080604  
 MX 200807925 A 20080627 MX 2008-7925 20080618  
 KR 2008079688 A 20080901 KR 2008-717522 20080718  
 PRIORITY APPLN. INFO.: US 2005-752318P P 20051221  
 WO 2006-US48979 W 20061221

AB The continuous process for production of poly(trimethylene terephthalate) comprises continuously producing poly(trimethylene terephthalate) oligomer by transesterification reaction of di-Me terephthalate with 1,3-propanediol at an elevated temperature or direct esterification reaction of terephthalic acid with excess 1,3-propanediol at an elevated temperature; continuously precondensing the poly(trimethylene terephthalate) oligomer to form a poly(trimethylene terephthalate) prepolymer and gaseous byproducts comprising volatilized byproduct 1,3-propanediol; and continuously polymerizing the poly(trimethylene terephthalate) prepolymer to form higher mol. weight poly(trimethylene terephthalate) and addnl. gaseous byproducts comprising volatilized byproduct 1,3-propanediol; wherein gaseous 1,3-propanediol byproduct resulting from the process is condensed in a condenser, and a portion of the condensed byproduct is recycled to the condenser while another portion is recycled back into the process.

L4 ANSWER 6 OF 42 CAPLUS COPYRIGHT 2008 ACS ON STN

ACCESSION NUMBER: 2007:29416 CAPLUS

DOCUMENT NUMBER: 146:280606

TITLE: Novel biopolymers as implant matrix for the delivery of ciprofloxacin: biocompatibility, degradation, and in vitro antibiotic release

AUTHOR(S): Fulzele, Suniket V.; Satturwar, Prashant M.; Dorle, Avinash K.

CORPORATE SOURCE: Department of Pharmaceutical Sciences, Nagpur University Campus, Nagpur, 440 033, India

SOURCE: Journal of Pharmaceutical Sciences (2006), Volume Date 2007, 96(1), 132-144

CODEN: JPMSAE; ISSN: 0022-3549

PUBLISHER: Wiley-Liss, Inc.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The purpose of this study was to investigate the in vitro-in vivo degradation and tissue compatibility of three novel biopolymers viz. polymerized rosin (PR), glycerol ester of polymerized rosin (GPR) and pentaerythritol ester of polymerized rosin (PPR) and study their potential as implant matrix for the delivery of ciprofloxacin hydrochloride. Free films of polymers were used for in vitro degradation in PBS (pH 7.4) and in vivo in rat s.c. model. Sample weight loss, mol. weight decline, and morphol. changes were analyzed after periodic intervals (30, 60, and 90 days) to monitor the degradation profile. Biocompatibility was evaluated by examination of the inflammatory tissue response to the implanted films on postoperative days 7, 14, 21, and 28. Furthermore, direct compression of dry blends of various polymer matrixes with 20%, 30%, and 40% weight/weight drug loading was performed to investigate their potential for implant systems. The implants were characterized in terms of porosity and ciprofloxacin release. Biopolymer films showed slow rate of degradation, in vivo rate being faster on comparative basis. Heterogeneous bulk degradation was evident with the esterified products showing faster rates than PR. Morphol. all the films were stiff and intact with no significant difference in

their appearance. The percent weight remaining in vivo was  $90.70 \pm 6.2$ ,  $85.59 \pm 5.8$ , and  $75.56 \pm 4.8$  for PR, GPR, and PPR films resp. Initial rapid drop in MW was demonstrated with nearly 20.0% and 30.0% decline within 30 days followed by a steady decline to nearly 40.0% and 50.0% within 90 days following in vitro and in vivo degradation resp. Biocompatibility demonstrated by acute and subacute tissue reactions showed minimal inflammatory reactions with prominent fibrous encapsulation and absence of necrosis demonstrating good tissue compatibility to the extent evaluated. All implants showed erosion and increase in porosity that affected the drug release. Increase in drug loading significantly altered the ciprofloxacin release in extended dissoln. studies. PPR produced drug release >90% over a period of 90 days promising its utility in implant systems. The results demonstrated the utility of novel film forming biopolymers as implant matrix for controlled/sustained drug delivery with excellent biocompatibility characteristics.

REFERENCE COUNT: 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 7 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:293084 CAPLUS

DOCUMENT NUMBER: 144:334002

TITLE: Glyceride-derived polyol esters as lubricity additives for low-sulfur diesel and jet fuels

INVENTOR(S): Yuen, May Choo; Sit, Foon Cheng; Ah, Ngan Ma; Yusof, Basiron

PATENT ASSIGNEE(S): Malaysian Palm Oil Board, Malay.

SOURCE: Eur. Pat. Appl., 7 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO.                                                                                                                                        | KIND | DATE     | APPLICATION NO. | DATE     |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------|----------|-----------------|----------|
| EP 1640439                                                                                                                                        | A1   | 20060329 | EP 2005-20081   | 20050915 |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU |      |          |                 |          |

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|----------------|----|----------|----------------|----------|
| US 20060117648 | A1 | 20060608 | US 2005-235075 | 20050927 |
|----------------|----|----------|----------------|----------|

PRIORITY APPLN. INFO.: MY 2004-3958 A 20040928

AB A lubricity additive, especially for low-sulfur diesel fuel and aircraft fuels (containing  $\leq 0.05$  weight% sulfur), are esters of C8-18-saturated and unsatd. fatty acids with polyhydroxy alcs. The additives can be prepared either by direct esterification of the fatty acids with the alc. or by transesterification of a plant-derived glyceridic oil with the polyhydroxy alc. Suitable fatty acids are derived from palm oil, palm kernel oil, groundnut oil, coconut oil, soybean oil, rapeseed oil, olive oil, sunflower oil, cottonseed oil, and tall oil; suitable polyhydroxy alcs. include neopentyl glycol, trimethylolpropane, trimethylolethane, pentaerythritol, and ethylene glycol. Preferred esters are mono-, di-, and trioleate esters of trimethylolpropane.

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 8 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2005:1012277 CAPLUS

DOCUMENT NUMBER: 143:459581  
 TITLE: Direct Atom-Efficient Esterification between Carboxylic Acids and Alcohols Catalyzed by Amphoteric, Water-Tolerant TiO(acac)<sub>2</sub>  
 AUTHOR(S): Chen, Chien-Tien; Munot, Yogesh S.  
 CORPORATE SOURCE: Department of Chemistry, National Taiwan Normal University, Taipei, 11650, Taiwan  
 SOURCE: Journal of Organic Chemistry (2005), 70(21), 8625-8627  
 CODEN: JOCEAH; ISSN: 0022-3263  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 143:459581  
 AB A diverse array of oxometallic species were examined as catalysts for a test direct condensation of benzoic acid and 2-phenylethanol in 1:1 stoichiometry. Besides group IVB MOCl<sub>2</sub>-xH<sub>2</sub>O and TiOX<sub>2</sub>-xH<sub>2</sub>O, group VB VOCl<sub>2</sub>-xTHF and group IVB TiO(acac)<sub>2</sub> were found to be the most efficient and water-tolerant catalysts for the test reaction. The new neutral catalytic protocol with the optimal TiO(acac)<sub>2</sub> tolerates many stereo/electronic structural variations in both (di)acid (1°-3° alkyl and aryl) and (di)alc. (1°, 2° alkyl, and aryl) components with high chemoselectivity.  
 REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 9 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2005:85768 CAPLUS  
 DOCUMENT NUMBER: 142:392802  
 TITLE: Method for preparing dimethyl carbonate by direct esterification of epoxypropane  
 INVENTOR(S): Wang, Fujun; Wang, Peilin; Gu, Chaoran; Hu, Xiamei  
 PATENT ASSIGNEE(S): Shanghai Petrochemical Co., Ltd. of China  
 SOURCE: Faming Zhuanli Shengqing Gongkai Shuomingshu, 12 pp.  
 CODEN: CNXXEV  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Chinese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO.                                                                                                                                                                                                                                                                                                    | DATE     |
|------------------------|------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| CN 1485312             | A    | 20040331 | CN 2002-137112                                                                                                                                                                                                                                                                                                     | 20020924 |
| PRIORITY APPLN. INFO.: |      |          | CN 2002-137112                                                                                                                                                                                                                                                                                                     | 20020924 |
| AB                     |      |          | The method comprises reacting epoxypropane and methanol with CO <sub>2</sub> in the presence of catalyst (KI, KCl, KBr, and/or K <sub>2</sub> CO <sub>3</sub> ) at 90-190° and CO <sub>2</sub> pressure of 5-30 MPa for 1-4 h, and separating to obtain di-Me carbonate, 1,2-propanediol, and propylene carbonate. |          |

L4 ANSWER 10 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:1128051 CAPLUS  
 DOCUMENT NUMBER: 142:197657  
 TITLE: Esterification of aldehydes and alcohols with pyridinium hydrobromide perbromide in water  
 AUTHOR(S): Sayama, Shinsei; Onami, Tetsuo  
 CORPORATE SOURCE: Department of Chemistry, Fukushima Medical University, Fukushima, 960-1295, Japan

SOURCE: Synlett (2004), (15), 2739-2745  
 CODEN: SYNLES; ISSN: 0936-5214  
 PUBLISHER: Georg Thieme Verlag  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 142:197657  
 AB The direct esterification of aldehydes and alcs. was carried out with pyridinium hydrobromide perbromide in water at room temperature  
 A variety of aldehydes were converted to resp. ester derivs. with alcs. such as methanol, 1,2-ethanediol, 1,3-propanediol. Further, a variety of aliphatic alcs. were also converted to the corresponding Tishchenko-like dimeric esters in good yields under the same reaction conditions.  
 REFERENCE COUNT: 51 THERE ARE 51 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 11 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:757588 CAPLUS  
 DOCUMENT NUMBER: 143:8091  
 TITLE: Synthesis of unsaturated polyester resin of p-phthalic acid type  
 AUTHOR(S): Fu, Xiangyang; Wang, Shuluan; Zhang, Yuling; Zhang, Dongmei  
 CORPORATE SOURCE: Xinmi Bureau of Quality and Technical Supervision, Xinmi, 452370, Peop. Rep. China  
 SOURCE: Henan Huagong (2003), (10), 20-21  
 CODEN: HEHUF3; ISSN: 1003-3467  
 PUBLISHER: Henansheng Shiyou Huaxue Gongye Keji Qingbao Zhongxinzhuan  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese  
 AB The unsatd. polyester resin, a benzoic acid end-capped copolymer of fumaric acid and di(2-hydroxyethyl) terephthalate, was prepared by direct esterification with terephthalic acid with 1,2-ethanediol in the presence of Sn(II) octanoate as catalyst at 170° for 1 h then at 200° to acid value of 100 mg KOH/g to obtain di(2-hydroxyethyl) terephthalate; polymerizing with fumaric acid in propanediol at 160° for 1 h then at 200° to acid value of 70 mgKOH/g, end-capping with benzoic acid at 200°; mixing with p-hydroquinone and paraffin, and allowing to react with styrene at 90° for 1 h.

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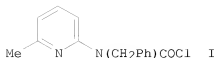
L4 ANSWER 12 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:120216 CAPLUS  
 DOCUMENT NUMBER: 141:332794  
 TITLE: Synthesis of PTT with direct esterification  
 AUTHOR(S): Wang Wei, Xiao-jing; He, Jin-zhang  
 CORPORATE SOURCE: Department of Material and Engineering, Beijing Institute of Clothing Technology, Beijing, 100029, Peop. Rep. China  
 SOURCE: Juzhi Gongye (2003), 16(6), 17-19, 39  
 CODEN: JGUOAD; ISSN: 1008-8261  
 PUBLISHER: Juzhi Gongye Bianjibu

DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese  
 AB Poly(trimethylene terephthalate) was prepared by direct esterification of terephthalic acid with 1,3-propanediol. Especially, the influence of reaction condition such as the catalyst type and concentration, feed composition, molar ratio of terephthalic acid to 1,3-propanediol, and rate of temperature rising were studied. The results show that the reaction is practical when titanil sulfate is used as catalyst for esterification and Sb2O3 is used for polycondensation.

L4 ANSWER 13 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2001:425661 CAPLUS  
 DOCUMENT NUMBER: 136:152737  
 TITLE: Preparation of active diluent for light-solidified paint  
 AUTHOR(S): Wu, Xiaochun  
 CORPORATE SOURCE: Nanjing, 210007, Peop. Rep. China  
 SOURCE: Huaxue Gongye Yu Gongcheng Jishu (2001), 22(2), 1-2  
 CODEN: HGGJFD; ISSN: 1006-7906  
 PUBLISHER: Huaxue Gongye Yu Gongcheng Jishu Bianjibu  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese

AB The 5 kinds of polyol polyacrylate active diluents (diethylene glycol diacrylate, triethylene glycol diacrylate, trimethylolpropane triacrylate, pentaerythritol triacrylate and pentaerythritol tetraacrylate) were prepared by direct esterification with acrylic acid, diethylene glycol, triethylene glycol, trimethylolpropane and pentaerythritol; and the suitable polymerization inhibitor, catalyst, solvent and ratio of alc. to acid were studied. The results showed that the yield of product reached 85%.

L4 ANSWER 14 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2000:97568 CAPLUS  
 DOCUMENT NUMBER: 132:236852  
 TITLE: Benzyl(6-methyl-2-pyridinyl)carbamoyl chloride: a new useful reagent for the direct esterification of carboxylic acids and selective benzoylation of diols  
 AUTHOR(S): Lee, Jae In; Park, Su Jin  
 CORPORATE SOURCE: Department of Chemistry, College of Natural Science, Dulsung Women's University, Seoul, 132-714, S. Korea  
 SOURCE: Bulletin of the Korean Chemical Society (2000), 21(1), 141-144  
 CODEN: BKCSDE; ISSN: 0253-2964  
 PUBLISHER: Korean Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 132:236852  
 GI



AB The title compound (I) was used for direct esterification of carboxylic acids and selective benzylation of diols at primary OH groups. The reactions were carried out in the presence of Et<sub>3</sub>N and DMAP.  
 REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 15 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 1999:755862 CAPLUS  
 DOCUMENT NUMBER: 132:79922  
 TITLE: Resistance of rosin esters to thermooxidative degradation  
 AUTHOR(S): Klyuev, A. Yu.; Shlyashinskii, R. G.; Prokopchuk, N. R.; Erdman, A. A.; Paplevko, I. G.; Stromskii, A. S.  
 CORPORATE SOURCE: Khim.-Tekhnol. Tsentr, NAN, Minsk, Belarus  
 SOURCE: Zhurnal Prikladnoi Khimii (Sankt-Peterburg) (1999), 72(2), 288-292  
 CODEN: ZPKHAB; ISSN: 0044-4618  
 PUBLISHER: Nauka  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Russian  
 AB Thermooxidative degradation of pinewood rosin and its esters with butanediol, propanediol, diethylene glycol, ethylene glycol, sorbitol, glycerol, and pentaerythritol were compared. Esterification of rosin led in all instances to products with higher thermooxidative degradation resistance than plain pinewood resin. A direct relation was found between the resistance of the esterified sample to thermooxidative degradation and mol. weight and hydroxyl content of the esterifying alc.

L4 ANSWER 16 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 1999:700019 CAPLUS  
 DOCUMENT NUMBER: 132:294084  
 TITLE: Synthesis and characterization of polytrimethylene terephthalate  
 AUTHOR(S): Chen, Guokang; Yang, Jiaqing; Gu, Lixia  
 CORPORATE SOURCE: China Textile University, Shanghai, 200051, Peop. Rep. China  
 SOURCE: Suliao Gongye (1999), 27(5), 1-3  
 CODEN: SUGOF9; ISSN: 1005-5770  
 PUBLISHER: Suliao Gongye Bianjibu  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese  
 AB Polytrimethylene terephthalate (PTT) was synthesized by direct esterification and polycondensation with terephthalic acid and 1,3-propanediol (PDO) as raw materials. The esterification conditions were: reaction temperature 215-235°, pressure 0.2-0.3 MPa, and molar ratio of PDO to PTA 1.4:1. The polymerization conditions were: reaction temperature 250- 270°, pressure 30-100 Pa, and time 4-5 h. The structure of PTT was characterized by IR and NMR, and

compared with that of PBT and PET. The production of byproducts was reduced when the polycondensation reaction was carried out at about 80% esterification conversion rate. The methylene number of PBT was 2.04 times that of PET and 1.34 times that of PTT, and that of PTT was 1.52 times that of PET. The flexibility of the macromol. chains was PBT > PTT > PET.

L4 ANSWER 17 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1998:571499 CAPLUS

DOCUMENT NUMBER: 129:313991

ORIGINAL REFERENCE NO.: 129:64033a,64036a

TITLE: Role of D,L-1,2-propanediol in ruminant glucose metabolism

AUTHOR(S): Palmquist, D. L.; Brunengraber, H.

CORPORATE SOURCE: Department of Animal Sciences, OARDC/The Ohio State University, Wooster, OH, USA

SOURCE: Energy Metabolism of Farm Animals, Proceedings of the Symposium on Energy Metabolism, 14th, Newcastle, Ire., Sept. 14-20, 1997 (1998), Meeting Date 1997, 115-118. Editor(s): McCracken, K. J.; Unsworth, E. F.; Wylie, A. R. G. CAB International: Wallingford, UK.

CODEN: 66QJAL

DOCUMENT TYPE: Conference

LANGUAGE: English

AB The gluconeogenic agent, D,L-1,2-propanediol (PG) is an antiketogenic agent in lactating cows. The primary route of PG metabolism is believed to be by absorption intact from the rumen, with ruminal conversion to propionate as a secondary route. We observed rapid responses in early lactation after oral drenching of PG; plasma glucose and insulin increased, and non-esterified fatty acids decreased, within 30 min. When PG was orally drenched or i.v. administered in lactating cows the L-isomers of both PG and lactate disappeared from plasma more rapidly than the D-isomers. Plasma concns. of PG peaked higher in orally-drenched than in i.v.-infused cows. Lactate concns. remained within the normal physiol. range in all cases. Peak plasma glucose (mM) and insulin (mU/mL) values after oral and i.v. doses were 4.1 and 30, and 3.5 and 16, resp. Two lactating cows were infused continuously with [6,6-2H<sub>2</sub>] glucose for 4 h. After 2 h, cows were orally dosed with 500 mL PG. Glucose turnover was not changed by PG, but glucose concentration increased, reflecting decreased

glucose disposal, probably resulting from peripheral utilization of lactate derived from PG. Our data support direct absorption and metabolism of PG as the primary route of utilization. Glucose may not be an intermediate.

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 18 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1998:558800 CAPLUS

DOCUMENT NUMBER: 129:176144

ORIGINAL REFERENCE NO.: 129:35799a,35802a

TITLE: Manufacture of poly(propylene terephthalate)

INVENTOR(S): Schmidt, Wolfgang; Thiele, Ulrich; Schauhoff, Stephanie; Yu, Dahai

PATENT ASSIGNEE(S): Zimmer A.-G., Germany; Degussa A.-G.

SOURCE: Ger. Offen., 5 pp.

CODEN: GWXXBX

DOCUMENT TYPE: Patent  
 LANGUAGE: German  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO.                                                                                | KIND | DATE     | APPLICATION NO.  | DATE     |
|-------------------------------------------------------------------------------------------|------|----------|------------------|----------|
| DE 19705249                                                                               | A1   | 19980813 | DE 1997-19705249 | 19970212 |
| US 5798433                                                                                | A    | 19980825 | US 1997-941997   | 19971001 |
| CN 1190661                                                                                | A    | 19980819 | CN 1997-122535   | 19971112 |
| CN 1094133                                                                                | C    | 20021113 |                  |          |
| TW 403765                                                                                 | B    | 20000901 | TW 1997-86116276 | 19971231 |
| EP 859020                                                                                 | A2   | 19980819 | EP 1998-101696   | 19980202 |
| EP 859020                                                                                 | A3   | 20020102 |                  |          |
| EP 859020                                                                                 | B1   | 20060607 |                  |          |
| R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO |      |          |                  |          |
| AT 328933                                                                                 | T    | 20060615 | AT 1998-101696   | 19980202 |
| PT 859020                                                                                 | T    | 20061031 | PT 1998-101696   | 19980202 |
| ES 2268741                                                                                | T3   | 20070316 | ES 1998-101696   | 19980202 |
| IN 194777                                                                                 | A1   | 20041204 | IN 1998-CA205    | 19980209 |

PRIORITY APPLN. INFO.:  
 DE 1997-19705249 A 19970212  
 US 1997-941997 A 19971001

AB The polyester, with acrolein content  $\leq 5$  ppm and allyl alc. content  $\leq 3$  ppm, is prepared by direct esterification of terephthalic acid with 1,3-propanediol in the presence of 30-200 ppm Ti (as  $TiO_2$ ), followed by deactivation of the Ti catalyst with a P-O compound and precondensation and polycondensation in the presence of a conventional Sb catalyst. Thus, 1 part terephthalic acid was esterified with 0.567 part 1,3-propanediol in the presence of 4:1  $TiO_2$ - $SiO_2$  coppt. (50 ppm Ti) and Co acetate (40 ppm Co) as color toner, treated with  $H_3PO_4$  (40 ppm P), and polycondensed in the presence of  $Sb(OAc)_3$  (250 ppm Sb) for 162 min at  $257-265^\circ$  to give a polyester with intrinsic viscosity 0.912 dL/g containing 4 ppm acrolein and 2.0 ppm allyl alc. and having color value  $b^* -0.5$ .

L4 ANSWER 19 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1998:30400 CAPLUS  
 DOCUMENT NUMBER: 128:101637  
 ORIGINAL REFERENCE NO.: 128:19909a,19912a  
 TITLE: Amorphous Sn/Si mixed oxides, mild solid Lewis acid catalysts for esterification and etherification reactions  
 AUTHOR(S): Storck, S.; Maier, W. F.; Salvado, I. M. Miranda; Ferreira, J. M. F.; Guhl, D.; Souverijns, W.; Martens, J. A.  
 CORPORATE SOURCE: Max-Planck-Institut für Kohlenforschung, Mulheim an der Ruhr, Germany  
 SOURCE: Journal of Catalysis (1997), 172(2), 414-426  
 CODEN: JCTLA5; ISSN: 0021-9517  
 PUBLISHER: Academic Press  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Novel amorphous porous mixed oxides of Sn, Si, and Al were prepared by the sol-gel process for use as solid acid catalysts. The materials were characterized by XRD, HRTEM, SEM, EDX, argon-physisorption, DRIFTS, and pyridine adsorption followed by FTIR. The catalysts show very few



Bronsted sites and some Lewis acid sites. The pore architecture of the materials was studied by the hydrocracking test of decane which indicated weak activity but clear shape selectivity for most of the mixed oxides. Further catalytic testing included the direct esterification reaction of pentaerythritol with stearic acid to pentaerythritol tetrastearate and the etherification of 1-hexanol and 1-naphthol with isobutene. The esterification reaction was studied under reaction conditions close to industrial ones. The catalysts were found to be as active as com. homogeneous and heterogeneous catalysts. While the activity found in the esterification reaction can be correlated with the increase in surface area and the decrease in Sn content, no correlation with microstructural parameters was found in the etherification reactions.

REFERENCE COUNT: 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 20 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1996:153059 CAPLUS  
DOCUMENT NUMBER: 124:290307  
ORIGINAL REFERENCE NO.: 124:53863a,53864a  
TITLE: Synthesis of pentaerythritol triacrylate  
AUTHOR(S): Xia, Zebin; Xie, Baoguo  
CORPORATE SOURCE: Dep. of Chem., Central South Univ. of Technology, Changsha, 410083, Peop. Rep. China  
SOURCE: Huaxue Shijie (1995), 36(10), 528-30  
CODEN: HUAKAB; ISSN: 0367-6358  
PUBLISHER: Shanghaiishi Huaxue Huagong Xuehui  
DOCUMENT TYPE: Journal  
LANGUAGE: Chinese

AB Pentaerythritol triacrylate (PETA) is synthesized from pentaerythritol and acrylic acid by direct esterification in the presence of catalysts. The effects of catalysts, polymerization inhibitors, acid/alc. ratio, and concentration of reactants on the esterification were studied, with emphasis on the polymerization inhibition. The best polymerization inhibition was achieved when CuSO<sub>4</sub> and hydroquinone at a ratio of 1:1 were used as polymerization inhibitors, toluene sulfonic acid as catalyst, the concentration of reactants was 50-55%, and acrylic acid/pentaerythritol ratio 3.4-3.6. The yield was ≥70%, and the purity of the prepared PETA was 94.9%.

L4 ANSWER 21 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1989:211070 CAPLUS  
DOCUMENT NUMBER: 110:211070  
ORIGINAL REFERENCE NO.: 110:35019a,35022a  
TITLE: Determination of mono- and diglycerides by high-performance liquid chromatography (HPLC)  
AUTHOR(S): Martin, E.; Duret, Monique; Vogel, J.  
CORPORATE SOURCE: Lab. Cantonal Chim., Geneva, CH-1211, Switz.  
SOURCE: Mitteilungen aus dem Gebiete der Lebensmitteluntersuchung und Hygiene (1989), 79(4), 406-12  
CODEN: MGLHAE; ISSN: 0026-6841  
DOCUMENT TYPE: Journal  
LANGUAGE: French

AB A direct-phase HPLC method over SiO<sub>2</sub> gel with refractometric

detection is described for the determination of mono- and diglycerides in edible fats whereby information is also obtained concerning the presence of esterified mono- and diglycerides. Detection limits of 0.2 and 0.1 mg/mL and repeatabilities of 3.7 and 8.8% for 1-palmitoylglycerol (I) and the dipalmitoylglycerols, resp., are reported, whereby the method does not allow the separation of the latter. For I, a linear detector response for the range 1-10 mg/mL was observed. The method may also be applied to 1,2-propanediol fatty acid esters. Cholesterol is reported to interfere with the diglyceride determination

=> d 14 22-32 ibib abs

L4 ANSWER 22 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1987:17862 CAPLUS  
DOCUMENT NUMBER: 106:17862  
ORIGINAL REFERENCE NO.: 106:3057a,3060a  
TITLE: Direct esterification of methacrylic acid with pentaerythritol  
AUTHOR(S): Flores Rueda, V. V.; Mekhtiev, S. I.; Shikhalizade, P. D.; Guseinova, A. G.  
CORPORATE SOURCE: Azerb. Inst. Neft. Khim., Baku, USSR  
SOURCE: Azerbaidzhanskii Khimicheskii Zhurnal (1985), (4), 96-8  
CODEN: AZKZAU; ISSN: 0005-2531  
DOCUMENT TYPE: Journal  
LANGUAGE: Russian

AB In the title esterification the maximum yield of  $\text{CH}_2\text{CMeCO}_2\text{C}(\text{CH}_2\text{OH})_3$  was obtained with mol ratio acid-alc. 4:1.2,  $\text{H}_2\text{SO}_4$  content 2.5%, at 120°.

L4 ANSWER 23 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1985:184696 CAPLUS  
DOCUMENT NUMBER: 102:184696  
ORIGINAL REFERENCE NO.: 102:28965a,28968a  
TITLE: Studies on derivatives of dioic acids. I. Preparation of diglyceryl ester of long chain dioic acids and its properties  
AUTHOR(S): Takasago, Mitsumasa; Horikawa, Kazuo; Masuyama, Shinroku  
CORPORATE SOURCE: Osaka Munic. Tech. Res. Inst., Osaka, 536, Japan  
SOURCE: Kagaku to Kogyo (Osaka, Japan) (1984), 58(8), 284-92  
CODEN: KKGQAG; ISSN: 0368-5918  
DOCUMENT TYPE: Journal  
LANGUAGE: Japanese

AB Dodecane-, hexadecane-, and eicosanedioic acids diglyceryl esters were prepared by the direct esterification in 3-chloro-1,2-propanediol with K salts of those acids. The esters were purified by repeated crystallization from benzene. Vegetable oils or mineral oils and water were emulsified in oil-in-water type high viscous emulsion by using these esters. The emulsifying power, the relation of viscosity and composition, and the stability of the emulsion under the different conditions were measured.

L4 ANSWER 24 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1979:103346 CAPLUS

DOCUMENT NUMBER: 90:103346  
 ORIGINAL REFERENCE NO.: 90:16315a,16318a  
 TITLE: Preparation, analysis and TLC separation of partial esters of fatty acids with polyvalent alcohols  
 AUTHOR(S): Neissner, R.  
 CORPORATE SOURCE: Edelfettwerke Werner Schlueter, Hamburg, Fed. Rep. Ger.  
 SOURCE: Fette, Seifen, Anstrichmittel (1978), 80(8), 303-11  
 CODEN: FSASAX; ISSN: 0015-038X  
 DOCUMENT TYPE: Journal  
 LANGUAGE: German  
 AB Direct esterification of 99% Me(CH<sub>2</sub>)<sub>n</sub>CO<sub>2</sub>H (n = 8, 10, 12, 14, 16) with H(OCH<sub>2</sub>CH<sub>2</sub>)<sub>n</sub>OH (n = 1, 2, 3), (HOCH<sub>2</sub>CH<sub>2</sub>)<sub>2</sub>S, HO(CH<sub>2</sub>)<sub>n</sub>OH (n = 2, 3, 4, 5, 6, 8, 10, 12), 1,2- and 1,3-butanediol, 2,5-hexanediol, 1,2,4-butanetriol, glycerol, 1,2,6-hexanetriol, trimethylolpropane and pentaerythritol in a mole ratio of 1:1.25 yielded 100 different ester mixts., which were purified and separated by thin-layer chromatog. into mono-, di-, tri-, and tetraesters and positional isomers.

L4 ANSWER 25 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 1978:581348 CAPLUS  
 DOCUMENT NUMBER: 89:181348  
 ORIGINAL REFERENCE NO.: 89:28181a,28184a  
 TITLE: Composition for coloring edges of books  
 INVENTOR(S): Kitner, I. P.; Grigor'eva, L. A.; Myslitskaya, L. P.; Shchipakina, O. A.; Ivankovich, L. V.  
 PATENT ASSIGNEE(S): "Pechatnyi Dvor" Leningrad Industrial-Technical Enterprises, USSR  
 SOURCE: U.S.S.R. From: Otkrytiya, Izobret., Prom. Obraztsy, Tovarnye Znaki 1978, 55(28), 115.  
 CODEN: URXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Russian  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO.             | KIND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | DATE     | APPLICATION NO. | DATE       |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|------------|
| SU 617468              | A1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 19780730 | SU 1976-2422117 | 19761122   |
| PRIORITY APPLN. INFO.: |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          | SU 1976-2422117 | A 19761122 |
| AB                     | The title composition, having low mark off and improved H <sub>2</sub> O resistance and color uniformity, consists of a dye 1-3, a binder 1-5, and H <sub>2</sub> O to 100%. The binder used is a pentaerythritol-esterified rosin adduct (I) and styrene-Me methacrylate-Bu acrylate-2-ethylhexyl acrylate copolymer [67967-61-7] in 50:30-70:10-20:5-10:5 ratio or I and melamine-HCHO condensation product [9003-08-1] in 50:70-50:30 ratio. The dye can be direct, reactive, or acid. |          |                 |            |

L4 ANSWER 26 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 1977:425816 CAPLUS  
 DOCUMENT NUMBER: 87:25816  
 ORIGINAL REFERENCE NO.: 87:4091a,4094a  
 TITLE: Alkenyl halolactone esters  
 INVENTOR(S): Kennedy, Brian R.; Lowe, Warren  
 PATENT ASSIGNEE(S): Chevron Research Co., USA  
 SOURCE: U.S., 7 pp.  
 CODEN: USXXAM

DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO. | DATE        |
|------------------------|------|----------|-----------------|-------------|
| US 3997570             | A    | 19761214 | US 1975-579125  | 19750519    |
| US 3755173             | A    | 19730828 | US 1971-169544  | 19710805    |
| PRIORITY APPLN. INFO.: |      |          | US 1971-169544  | A3 19710805 |
|                        |      |          | US 1973-335284  | A2 19730223 |

AB An ashless detergent-dispersant for lubricating oils is the reaction product of pentaerythritol and a lactonized chlorinated (polyisobutenyl)succinic anhydride and MeOH or H<sub>2</sub>O. Thus, the pentaerythritol ester (I) of lactonized (polyisobutenyl)succinic acid is prepared by direct esterification of the acid or alkaline transesterification of its Me ester, which is obtained by the reaction of (polyisobutenyl)succinic anhydride with MeOH in C<sub>6</sub>H<sub>6</sub> and sparging with Cl<sub>2</sub> at 70-110°F. Lubricants containing I have good ratings in the Ford 6-cylinder engine varnish test, the 180 psi BMEP Caterpillar diesel engine test, the neutralization rate test, and the Cu-Pb L-38 strip corrosion test and are superior to those containing com. succinimides or esters.

L4 ANSWER 27 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1976:44942 CAPLUS  
 DOCUMENT NUMBER: 84:44942  
 ORIGINAL REFERENCE NO.: 84:7401a,7404a  
 TITLE: Removal of unreacted acid from polythiolenic polyesters  
 INVENTOR(S): Young, Richard A.; Radak, William J.  
 PATENT ASSIGNEE(S): De Soto, Inc., USA  
 SOURCE: U.S., 4 pp.  
 CODEN: USXXAM

DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO. | DATE       |
|------------------------|------|----------|-----------------|------------|
| US 3919349             | A    | 19751111 | US 1974-507902  | 19740920   |
| JP 51043711            | A    | 19760414 | JP 1975-100582  | 19750819   |
| PRIORITY APPLN. INFO.: |      |          | US 1974-507902  | A 19740920 |

AB The unreacted acid remaining after the direct esterification of polyhydric alcs. with monoethylenic monocarboxylic acids is converted to a hydroxy ester by treatment with epoxides selected to modify the properties of the ester products. Thus, a mixture of trimethylolpropane [77-99-6] 670, acrylic acid [79-10-7] 1235, methylcyclohexane 635, and p-methoxyphenol 0.75 g was heated to 40°, 6.35 g H<sub>2</sub>SO<sub>4</sub> was added, and the mixture was heated .apprx.17 hr until the azeotrope showed no water present and the acid value was 60. Then 467.5 g Der 736 (polypropylene glycol diglycidyl ether) [26142-30-3] and 27.7 g pyridine were added to the trimethylolpropane triacrylate [15625-89-5] product and the mixture was heated until the acid value was <5. In a similar procedure the excess acid present in the manufacture of pentaerythritol triacrylate [3524-68-3] was converted to an ester with Aradite 6010 (bisphenol A-epichlorohydrin polymer) [25068-38-6].

L4 ANSWER 28 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1973:71354 CAPLUS  
DOCUMENT NUMBER: 78:71354  
ORIGINAL REFERENCE NO.: 78:11337a,11340a  
TITLE: Synthesis and oxyethylation of esters of pentaerythritol and fatty acids  
AUTHOR(S): Perka, Jerzy; Ropuszynski, Stanislaw  
CORPORATE SOURCE: NZPO "Rokita", Brzeg Dolny, Pol.  
SOURCE: Przemysl Chemiczny (1972), 51(12), 796-800  
CODEN: PRCHAB; ISSN: 0033-2496  
DOCUMENT TYPE: Journal  
LANGUAGE: Polish

AB The direct esterification of pentaerythritol with lauric, stearic, and oleic acids, under varying exptl. conditions, was studied. The resulting esters were oxyethylated with ethylene oxide and the products analyzed by thin layer chromatog.

L4 ANSWER 29 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1972:155951 CAPLUS  
DOCUMENT NUMBER: 76:155951  
ORIGINAL REFERENCE NO.: 76:25405a,25408a  
TITLE: Polyhydric alcohol esters of  $\alpha$ -sulfo fatty acids  
AUTHOR(S): Micich, T.; Sucharski, M.; Weil, J. K.; Stirton, A. J.  
CORPORATE SOURCE: East. Reg. Res. Lab., Agric. Res. Serv., Philadelphia, PA, USA  
SOURCE: Journal of the American Oil Chemists' Society (1972), 49(2), 90-1  
CODEN: JAOCA7; ISSN: 0003-021X  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Direct esterification of  $\alpha$ -sulfopalmitic and  $\alpha$ -sulfostearic acids with excess ethylene glycol, glycerol, pentaerythritol, and 2-methoxyethanol in CCl<sub>4</sub> yielded mostly monoesters (I). Surface-active properties of I were measured with emphasis on washing ability in combination with soap and I detergency was compared with that of hexitol and sucrose  $\alpha$ -sulfo fatty esters. Although I had moderate lime soap dispersibility, their detergency showed synergism when combined with soap.

L4 ANSWER 30 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1971:464322 CAPLUS  
DOCUMENT NUMBER: 75:64322  
ORIGINAL REFERENCE NO.: 75:10209a,10212a  
TITLE: Synthesis and polymerization of some dimethacrylic glycol esters  
AUTHOR(S): Sivergin, Yu. M.; Mirenskaya, N. B.; Shashkova, V. T.; Kefeli, T. Ya.  
CORPORATE SOURCE: Inst. Khim. Fiz., Moscow, USSR  
SOURCE: Kinet. Mech. Polyreactions, Int. Symp. Macromol. Chem., Prepr. (1969), Volume 3, 215-19. Akad. Kiado: Budapest, Hung.  
CODEN: 23MIAZ  
DOCUMENT TYPE: Conference  
LANGUAGE: Russian

AB Ethylene glycol dimethacrylate, 1,3-propylene glycol dimethacrylate, 1,4-butanediol dimethacrylate, 1,6-hexanediol dimethacrylate,

1,10-decanediol dimethacrylate, 2,2-dimethyl-1,3-propanediol dimethacrylate, diethylene glycol dimethacrylate were prepared by direct esterification in the presence of p-MeC<sub>6</sub>H<sub>4</sub>SO<sub>3</sub>H with azeotropic distillation of the H<sub>2</sub>O formed. The polymerization rate of these glycol dimethacrylates at 75° decreased in the stated order of monomers, and increased with the Bz<sub>2</sub>O<sub>2</sub> concentration. The kinetic parameters for these polymerization are given.

L4 ANSWER 31 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1969:413569 CAPLUS  
DOCUMENT NUMBER: 71:13569  
ORIGINAL REFERENCE NO.: 71:2509a,2512a  
TITLE: Polymerizing a glycolide  
INVENTOR(S): Schmitt, Edward Emil; Epstein, Martin; Polistina, Rocco A.  
PATENT ASSIGNEE(S): American Cyanamid Co.  
SOURCE: U.S., 4 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO. | DATE       |
|------------------------|------|----------|-----------------|------------|
| US 3442871             | A    | 19690506 | US 1966-547449  | 19660504   |
| GB 1188296             | A    | 19700415 | GB 1967-1188296 | 19670414   |
| PRIORITY APPLN. INFO.: |      |          | US 1966-547449  | A 19660504 |
|                        |      |          | US 1966-557607  | A 19660615 |

AB Glycolide compns. containing 0.05-1.5 mole % alc. free of non-benzenoid unsatn. and devoid of any reactive group other than alc. OH groups and 0.0005-0.0025% SnCl<sub>2</sub>.2H<sub>2</sub>O were polymerized at 210-45° for 50-120 min. The polymeric melt could be extruded into filaments suitable for use as synthetic sutures. Thus, 400 parts glycolic acid was heated to 200° in 4 hrs. When the pot temperature had reached 185°, the pressure of the system was reduced from atmospheric to 15 mm. so that H<sub>2</sub>O of condensation and (or) esterification distilled off. The residue was cooled and pulverized to give 280 parts powder which was added in small increments to a suitable pyrolysis chamber maintained at 250-85° and <15 mm. The 238 parts distillate was dissolved in a min. amount of hot EtOAc and after decolorizing and purifying with active C was recrystd. to provide 160 parts glycolide. m. 82.5-4°. A glass tube having a bore of 0.3 in. and containing a magnetic steel ball 0.15625 in. in diameter was charged with a mixture of glycolide composition 3, 0.1% ether solution of SnCl<sub>2</sub>.2H<sub>2</sub>O 0.04, and lauryl alc. 0.0166 part. The tube was evacuated, purged with Ar, re-evacuated to <1 mm., and the top was sealed. The tube was placed in vertical position in a closed glass chamber through which di-Me phthalate was refluxed at 222°. At periodic intervals after melting, the viscosity of the reaction mixture was measured by raising the steel ball by means of a magnet and measuring the rate of the fall of the ball in sec./in. Ninety min. after the melt was first achieved, the ball drop time was 550 sec./in. for .apprx.7200 poises and after 120 min., the ball drop time was 580 sec./in. or .apprx. 7600 poises. The rate of fall of the ball was a significant tool in determining the viscosity of the polymeric

material and was related to the mol. weight of the polymerized glycolides compns.

Equations were presented to show that a direct proportion existed between the measured ball drop time and the conventional melt viscosity units. The melt viscosity in poises was equal to the product of the ball drop time in seconds and 13.13. Addnl. polymers were similarly prepared using hexyl alc., cyclohexanol, diethylene glycol, trimethylol ethane, or pentaerythritol as the alc.

L4 ANSWER 32 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 1968:41101 CAPLUS  
 DOCUMENT NUMBER: 68:41101  
 ORIGINAL REFERENCE NO.: 68:8031a,8034a  
 TITLE: Phosphorous containing flameproof coatings  
 INVENTOR(S): Heslinga, Adolf; Napjus, Petrus J.  
 PATENT ASSIGNEE(S): Chemische Fabrik Kalk G.m.b.H.  
 SOURCE: Ger., 4 pp.  
 CODEN: GWXXAW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: German  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:

| PATENT NO.             | KIND | DATE     | APPLICATION NO. | DATE       |
|------------------------|------|----------|-----------------|------------|
| DE 1243870             | B    | 19670706 | DE 1963-C29447  | 19630322   |
| NL 6400482             | A    | 19640923 | NL 1964-482     | 19640122   |
| BE 645501              | A    | 19640921 | BE 1964-645501  | 19640320   |
| NL 6917423             | A    | 19700126 | NL 1969-17423   | 19691119   |
| PRIORITY APPLN. INFO.: |      |          | DE 1963-C29447  | A 19630322 |

AB Colorless, transparent, flameproof coatings are prepared from BrCH<sub>2</sub>CH<sub>2</sub>OP(O)Cl<sub>2</sub> (I) and pentaerythritol (II). Thus, 48.4 parts I and 27.2 parts II was refluxed until completion of the reaction. The temperature was raised to 180° for a short time and HCl driven off under reduced pressure to give 55 parts of a liquid product (III), with acid number 65, OH number 200, and esterification number 402. Exposure to strong heat radiation or a flame caused III to swell and blacken into an unburnable foam. The foam weighed 40% of III. A solution of 50 parts III and 50 parts butylated melamine resin in BuOH was homogenized and a 3-mm. coating applied over a sheet of plywood. The lacquer was heated 30 min. at 80-90°, and 60 min. at 120° to form a 0.2-mm. transparent layer containing 10% Br and 8.1% P. Direct application of a Bunsen burner flame caused the lacquer to give a 1-cm. nonflammable foam which protected the wood even under continued application of heat. The lacquer gave protection after being immersed in water for 5 weeks. The lacquer can also be mixed with epoxide resins, in which case ethylenediamine or diethylenetriamine should be included.

=> d 14 33-42 ibib abs

L4 ANSWER 33 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 1960:83718 CAPLUS  
 DOCUMENT NUMBER: 54:83718  
 ORIGINAL REFERENCE NO.: 54:15965c-g  
 TITLE: Catalyzed esterification of oleic acid  
 AUTHOR(S): Dunlap, L. H.; Heckles, J. S.

CORPORATE SOURCE: Armstrong Cork Co., Lancaster, PA  
 SOURCE: Journal of the American Oil Chemists' Society (1960),  
 37, 281-5  
 CODEN: JAOCA7; ISSN: 0003-021X  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable  
 AB The quant. effects of type and concentration of catalyst and temperature on  
 the rate of  
 esterification of oleic acid with ethylene glycol were studied.  
 For this esterification at 180° with 0.005M metal-salt  
 catalyst/100 g. of oleic acid, the 2nd-order rate consts. of the metals  
 tested (as the acetates) were: Zn++ 0.0192, Mn++ 0.0133, Pb++ 0.0130, Cd++  
 0.0121, Mg++ 0.0096, Ca++ 0.0092, Cu++ 0.0072, Hg++ 0.0067. Some, tested  
 as the salicylates, showed rates close to those of the comparable acetate.  
 The rate constant for TiCl4 was 0.0093. The reaction rate increased with  
 the concentration of added catalyst, but not entirely in direct  
 proportion. The energy of activation calculated from the rates of  
 esterification at various temps. was 14.8 kcal./mole. The  
 2nd-order rate consts. (%/hr.) at 180°, 0.005M Zn(OAc)2/100 g. for  
 esterification of oleic acids with various alcs. were:  
 1,4-butanediol 0.050, dodecyl alc. 0.04, octadecyl alc. 0.047,  
 1,10-decanediol 0.041, 1,5-pentanediol 0.040, 1,3-propanediol  
 0.038, ethylene glycol 0.033, pentaerythritol 0.035,  
 trimethylene glycol 0.033, diethylene glycol 0.032, triethylene glycol  
 0.025, 2,2-dimethyl-1,3-propanediol 0.026, 2,2-diethyl-1,3-  
 propanediol 0.026, glycerol 0.023. The rates of  
 esterification, using the metal salts, were not as great as for  
 strong acids, but it is probable that the mechanism is similar, and the  
 metal salts act as acids in the general sense. It is probable that the  
 differences in the rates of esterification of the different  
 alcs. and polyalcs. are related to the comparative acidity or basicity of  
 the alcs. 22 references.

L4 ANSWER 34 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1959:32028 CAPLUS  
 DOCUMENT NUMBER: 53:32028  
 ORIGINAL REFERENCE NO.: 53:5741b-e  
 TITLE: Mixed esters of pentaerythritol  
 INVENTOR(S): Dehm, Henry C.  
 PATENT ASSIGNEE(S): Hercules Powder Co.  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Unavailable  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | APPLICATION NO. | DATE     |
|------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------|
| -----      | ---- | -----                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -----           | -----    |
| US 2865954 |      | 19581223                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | US 1957-676357  | 19570805 |
| AB         |      | Improved vinyl chloride plastisols are provided by incorporation therein<br>of polymerizable plasticizers which are mixed esters of<br>pentaerythritol (I) in which 0.5-2.5 OH groups are<br>esterified with acrylic or methacrylic acid and the remainder with<br>a saturated C2-10 monocarboxylic acid. Such esters are prepared by<br>direct esterification in the presence of a<br>polymerization inhibitor, such as Cu. Thus, nitration grade I 1362,<br>methacrylic acid 2583, and butyric acid 1762 (1:3:2 mole ratio) were mixed<br>and powdered Cu 7, hydroquinone 2.3, concentrated H2SO4 21, and toluene 432<br>parts |                 |          |



were added. The mixture was sparged with CO<sub>2</sub>, heated for >80 min. to 152°, the temperature lowered during 30 min. to 100°, and the heat removed, 554 parts water being removed to this point. Distillation at 29-39 mm. gave 1336 parts of a clear distillate and a residue of a clear oil containing powdered Cu. The latter was filtered out, the oil diluted with its own volume of Et<sub>2</sub>O, cooled with ice, extracted with 5N NaOH, washed with brine, dried over anhydrous Na<sub>2</sub>SO<sub>4</sub>, filtered, 1 part hydroquinone added, and the clear liquid evaporated to constant weight during 0.5 hr. to give 3280 parts of a pale-yellow liquid with a viscosity of 85 centipoises and a pleasant odor, mol. weight 334-5, saponification number 486-7, Br number 55, and OH value 4.55-4.56. The liquid is a superior plasticizer.

L4 ANSWER 35 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1955:34437 CAPLUS  
DOCUMENT NUMBER: 49:34437  
ORIGINAL REFERENCE NO.: 49:6622f-i  
TITLE: Mixed esters and coating compositions containing the esters  
PATENT ASSIGNEE(S): N. V. de Bataafsche Petroleum Maatschappij  
DOCUMENT TYPE: Patent  
LANGUAGE: Unavailable  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

| PATENT NO. | KIND | DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | APPLICATION NO. | DATE  |
|------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------|
| -----      | ---- | -----                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -----           | ----- |
| NL 76235   |      | 19541015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | NL              |       |
| AB         |      | Polyhydric alcs. are esterified partly with an aromatic monocarboxylic acid having one of its ring C atoms coupled with an open-chain aliphatic radical which contains a quaternary C atom, and partly with an unsatd. monocarboxylic acid. Preferably 25-75% of the OH groups is esterified with the first, and the rest with the second acid. Instead of direct esterification, preparation of the mixed esters can be carried out by exchange of ester groups. Examples of the first type of acid are p-tert-butylbenzoic acid or its substitution products, or 4-tert-butyl-1-naphthoic acid. Examples of the second type are the free fatty acids or the monoglycerides derived from drying or semidrying oils, rosins, or tall oil. The alcs. are glycerol, pentaerythritol, aliphatic diols, or polyvinyl or polyallyl alcs. An addnl. esterification of the mixed esters can be carried out with a third type of acid, such as phthalic, succinic, or maleic acid. The esters are valuable components of varnishes and lacquers. They have the special advantage of miscibility with cellulose lacquers. Thus, 500 parts soybean oil monoglycerides, 500 parts p-tert-butylbenzoic acid, and 150 parts xylene are heated at 250° for 9 hrs. The ester is used as such (with a thinner), or mixed with tung oil. |                 |       |

L4 ANSWER 36 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1954:25124 CAPLUS  
DOCUMENT NUMBER: 48:25124  
ORIGINAL REFERENCE NO.: 48:4581h-i, 4582a-b  
TITLE: Borates of tertiary alcohols  
INVENTOR(S): Lippincott, Samuel B.

PATENT ASSIGNEE(S): Standard Oil Development Co.  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Unavailable  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE     | APPLICATION NO. | DATE     |
|------------|------|----------|-----------------|----------|
| US 2642453 |      | 19530616 | US 1947-776199  | 19470926 |

AB The neutral borates of aliphatic, cyclic, and aralkyl tertiary alcohols are obtained by the direct esterification of the tertiary alc. with H<sub>3</sub>BO<sub>3</sub> if the water formed during the reaction is azeotropically removed with a suitable carrier such as C<sub>6</sub>H<sub>6</sub>, PhMe, petr. naphtha (b. 73-110°), or CCl<sub>4</sub>. A fractionating column must be arranged over the refluxing mixture so that the aqueous phase of the condensed distillate may be removed while the carrier is continuously returned to the systems. Thus, refluxing 123.6 g. (2 moles) H<sub>3</sub>BO<sub>3</sub>, 667 g. (9 moles) tert-BuOH, and 500 ml. C<sub>6</sub>H<sub>6</sub> 184 hrs. gave 111 ml. of aqueous layer and yielded 293 g. (64%) tert-Bu borate, b<sub>760</sub> 175°, n<sub>D20</sub> 1.3879, d<sub>20</sub> 0.8153. In other examples petr. naphtha and CCl<sub>4</sub> were used with similar results. The following tertiary alc. borates were similarly prepared: tert-amyl, b<sub>760</sub> 235°, n<sub>D20</sub> 1.4124, d<sub>20</sub> 0.8482; tert-hexyl (from PrC(OH)Me<sub>2</sub>) collected at 74-95°/1 mm.; terpinyl (from α-terpineol); linolyl; pinacol, m. 193-6°; 3-methyl-1,3-butanediol; 2,3-dimethyl-1,3-butanediol; 2-methyl-2,4-pentanediol; 2-methyl-1,2-propanediol (isobutylene glycol borate); dimethylphenylcarbinyl. Terpin hydrate was also esterified.

L4 ANSWER 37 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 1954:9331 CAPLUS  
 DOCUMENT NUMBER: 48:9331  
 ORIGINAL REFERENCE NO.: 48:1703h-i,1704a-b  
 TITLE: Polyesters in linoleum manufacture  
 AUTHOR(S): Walker, F. T.; Mackay, T.  
 SOURCE: Journal of the Oil and Colour Chemists' Association (1951), 34, 311-36  
 CODEN: JOCCAB; ISSN: 0030-1337  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Unavailable

AB An attempt is described to produce a polyester mass as a direct substitute for linoleum binder (or "Cement" as it is known in the industry) made from linseed oil. The type of polyester discussed is a product which is obtained when a saturated dibasic acid is condensed with a polyhydric alc., in which the cross-linkages between polymeric chains, as well as the polymeric chains themselves, contain ester groupings. Properties of the gel, uncured and cured sheet are detailed. The work of Carothers (C.A. 30, 2457.3) on polyesters is discussed along with illustrations of simple esterification and polyesterification reactions. The authors discuss the preliminary results obtained by reacting aliphatic dibasic acids and polyhydric alcohol to the gel point. A review of the general theory of condensation pertinent to the polyester reaction is explained by describing the work of Carothers (loc. cit.) and Flory (C.A. 36, 312.6; 40, 6881.3). The reaction between adipic acid and pentaerythritol is explained along with some of the difficulties encountered with this type of gel. Methods of modifying this gel with plasticizers and retarding agents are explained. A two-stage process for manufacturing a modified polyester gel is described. The authors discuss and

show qualitatively the configuration of gelled linseed oil could be expected to bear a certain resemblance to the polyester gels explained in the paper. A description is given of the German polyester binders of Li 160, a condensation product of adipic acid and trimethylol propane, along with methods of manufacture. The authors conclude that, in quality, the greatest disability of the polyester gel lies in its high proportion of ester linkages, which renders it more susceptible than linseed oil cement to the action of mild alkalies and to hydrolysis. 30 references.

L4 ANSWER 38 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1953:49860 CAPLUS

DOCUMENT NUMBER: 47:49860

ORIGINAL REFERENCE NO.: 47:84061,8407a-b

TITLE: Polymeric plasticizers. Preparation and characterization of a series of terminated polyesters  
 AUTHOR(S): Koroly, Joseph E.; Beavers, Ellington M.  
 CORPORATE SOURCE: Rohm & Haas Co., Philadelphia, PA  
 SOURCE: Journal of Industrial and Engineering Chemistry (Washington, D. C.) (1953), 45, 1060-3  
 CODEN: JIECAD; ISSN: 0095-9014

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB The general schematic structure for terminated polyesters L-G-(-A-G)-n-L, where A represents a dibasic acid, L a mono-basic acid, G a dihydric alc., and n is the number of repeating units, is the basis of preparation of a polymeric

plasticizer series. The monobasic acid of the reported study is lauric; the dibasic acids are succinic, adipic, sebacic, glutaric, thiodipropionic, azelaic, and  $\gamma$ -methyl- $\gamma$ -acetylpmelic; the glycols are 1,2-propylene, ethylene, trimethylene, 1,3-butylene, 2,2-dimethyl-1,3-propanediol, and 2-ethyl-2-butylpropanediol; and the values of n are 1-10. The rate and degree of completion of the first reaction stage, which was direct esterification, was characterized by determination of the acid number; and that of the second reaction stage, which was polymerization by trans-esterification, was characterized by melt viscosity of the reaction mixture 20 references.

L4 ANSWER 39 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1953:5256 CAPLUS

DOCUMENT NUMBER: 47:5256

ORIGINAL REFERENCE NO.: 47:883d-e

TITLE: Methyl  $\alpha$ -D-glucoside oils

AUTHOR(S): Gibbons, John P.; Janke, Robert A.

CORPORATE SOURCE: Mellon Inst., Pittsburgh, PA

SOURCE: Journal of the American Oil Chemists' Society (1952), 29, 467-9

CODEN: JAOCA7; ISSN: 0003-021X

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB Drying oils were prepared by the direct esterification of Me-D-glycoside and linseed fatty acids. Litharge was an effective catalyst for the reaction. These Me-D-glucoside oils (I) bodied more rapidly at 310° than similar synthetic glycerol or pentaerythritol oils. With Bakelite BR-254 resin, I cooked rapidly into 25-gallon length varnishes that dried quickly to hard films with good alkali and water resistance and excellent adhesive properties.

L4 ANSWER 40 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1952:59102 CAPLUS

DOCUMENT NUMBER: 46:59102

ORIGINAL REFERENCE NO.: 46:9868h-i,9869a-c

TITLE: Esters of pentaerythritol and fatty acids

AUTHOR(S): Savory, Pierre

CORPORATE SOURCE: Univ. Marseille

SOURCE: Ann. faculte Sci. Marseille (1950), 20, 39-166

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB Pentaerythritol (I) tetraesters of C12, C14, C16, and C18 saturated fatty acids prepared according to Bhattacharya (C.A. 25, 1801) and Wheeler (C.A. 34, 2331.7) with p-toluenesulfonic acid as catalyst contained no polymers. Phys. properties were similar to those of corresponding triglycerides. Saponification was slower and less complete. Fatty acid esterification with I and that with glycerol (II) start as 2 phases; the monoesters formed dissolve in the acids and are further esterified. Greater yields result with lauric acid because monolaurate is more soluble than monostearate. In comparing I and II the action was similar but solubility was lower with I. A method with PhOH as a mutual solvent worked well on a small scale, but on a large scale, separation of PhOH was tedious and attended with interesterification. Soap as a mutual solvent increased yield, but difficulties such as formation of emulsions, acrolein, and polymers occurred. On calculating on the basis of "theory of random distribution" at given ratios of OH (as glycol, I, or II) to COOH (fatty acids) groups production of esters was usually less than theory for I esters, because the theory presumes complete miscibility. In extending this observation to dipentaerythritol, mannitol, and sorbitol, higher proportions of monoesters would be expected with these higher poly alcs., but since solubility would be less deviation from random theory would be greater. Preparation of diesters of I was attempted by blocking 2 OH groups of I with acetone, or 2 Br radicals, combining with fatty acid chloride, and hydrolyzing off the blocking agent. With the acetone technique higher esters were formed along with the diester, whereas with the Br blocking technique hydrolysis of the Br with AgNO3 was too slow. Reaction of the dibromo or the diodo compound of I with soaps produced the diester, but yield was lower than theor. It seemed that the only method for preparation of pure di-fatty acid ester of I involves direct esterification and the difficult separation. Interfacial tension detns. indicated that monoester of I is a superior emulsifier than that of II; but, either are greatly inferior to soaps.

L4 ANSWER 41 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1949:13185 CAPLUS

DOCUMENT NUMBER: 43:13185

ORIGINAL REFERENCE NO.: 43:2622d-i,2623a-d

TITLE: Nicotinic acid esters of mono- and polyhydroxy alcohols and their alkyl halide derivatives

AUTHOR(S): Charonnat, R.; Harispe, M.; Harispe, J. V.;

Chevallard, L.

SOURCE: Bulletin de la Societe Chimique de France (1948)

1014-17

CODEN: BSCFAS; ISSN: 0037-8968

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB The synthesis and properties of 26 alkyl esters of 3-pyridinecarboxylic

acid, (I), of which 13 have not been described, and some of their methobromides, methiodides, and PhCH<sub>2</sub>Br compds. The esters of mono-HO alcs. prepared are colorless or feebly yellow crystals, darkening slightly in the light and distilling without decomposition at 4-8 mm. The odor and water solubility decrease on going up the series. The esters of hexadecyl, benzyl, bornyl, cholesteryl, and all poly-HO alcs. are solids at ordinary temps. Esters of I: Me, m. 38°; methobromide, m. 140-2° (instead of 71°) (yield 95%); PhCH<sub>2</sub>Br compound, white, yellowing, hygroscopic crystals from acetone, m. 108°; methiodide, clear yellow, m. 130° (yield 70%). Et b12 103.5°, b33 129°; HCl salt, m. 126°, hygroscopic, easily changed by heat to I.HCl; methobromide, colorless crystals yellowing superficially, m. 50.5-1°, extremely hygroscopic (yield 96%); methiodide, yellow (96%). 2-Chloroethyl, from nicotinyl chloride (II) and ClCH<sub>2</sub>CH<sub>2</sub>OH in C<sub>6</sub>H<sub>6</sub> (72.5%), yellow, b5 130°, giving on standing colorless crystals, m. 28°. 2-Diethylaminoethyl, from Et<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>OH and II in anhydrous C<sub>6</sub>H<sub>6</sub> (40%), b6 139°, characterized as its HCl salt, by various authors, as being devoid of anesthetic and antispasmodic properties. n-Pr, by direct esterification of I (66%), b23 134°; methiodide, clear yellow crystals from water, m. 113-14°. iso-Pr (56%), b27 131°. Allyl, sensitive to prolonged action of heat (at the end of the preparation, the benzene must be removed by heating under reduced pressure) (yield 66%), b11 118.5-19.5°. Bu (69%), b8 122-3°, b11, 130°; methiodide, clear yellow crystals reddening in the light, m. 103-4° (66%). iso-Bu (78%), b8 110-11°. tert-Bu, b8 108° (5%). iso-Am (73.6%), b9 129°. Heptyl (57%), b6 155-7°. sec-Octyl, b9 161° (60%); methobromide, extremely hygroscopic. Hexadecyl, waxy mass, m. 35° (66%). Benzyl (72%), b12 188-9°, forming on long standing colorless crystals, m. 24°; methobromide, slightly hygroscopic, m. 160-1° (95%); methiodide, pale yellow crystals (75%); PhCH<sub>2</sub>Br compound, pink crystals from water, m. 201.5° (72%). Phenethyl (66%), b12 197-9°. Cyclohexyl (66.5%), b11 161°; methobromide, colorless crystals (80%). 2-Methylcyclohexyl (50.6%), pale yellow, b4.5 145.5°. 4-Methylcyclohexyl (60%), b6 153.5-5.5°. Menthyl (79%), b6 165°, b10 180°; HCl salt, m. 130°. Bornyl (70%), m. 39-40°, b5 175°, b9 179°. Cholesteryl (80%), m. 148.5° (from C<sub>6</sub>H<sub>6</sub>), relatively insol. in acetone and boiling absolute EtOH; methiodide, voluminous precipitate from absolute EtOH, m. 269-70° (71%). Glycol diester, C<sub>14</sub>H<sub>26</sub>O<sub>4</sub>N<sub>2</sub> (72.5%), long needles from EtOH, m. 126.5°. Propylene glycol diester (76%), m. 122.5° (from C<sub>6</sub>H<sub>6</sub>), b7 231°, b12 237.5°. Glycerol triester (75%), m. 76° (from acetone); N found 9.75 and 9.69, calculated 10.31 (triester), 9.27 (diester). Pentaerythritol tetraester (87%), needles from CHCl<sub>3</sub>, m. 162°; methobromide, pale rose, m. 214° (decomposition) (85%). Glucose pentaester (64%), m. 169° (from Me<sub>2</sub>COEt<sub>2</sub>O); methobromide, light yellow crystals, very hygroscopic (80%). Optical consts.: Ester, t°, n<sub>D</sub> (n<sub>F</sub>-n<sub>C</sub>)104, (n<sub>D</sub> - 1)/ = (n<sub>F</sub>-n<sub>C</sub>); Et, 12.5, 1.5066, 156, 32.4; ClCH<sub>2</sub>CH<sub>2</sub>, 16.5, 1.5328, 159.7, 33.3; Et<sub>2</sub>NCH<sub>2</sub>CH<sub>2</sub>, 16.5, 1.5191, 150.4, 34.5; Pr, 16.5, 1.4987, 148.4, 33.6; iso-Pr, 16.5, 1.4918, 142, 34.6; allyl, 12.2, 1.5210, 167, 31.1; Bu, 17.0, 1.4950, 137, 36.1; iso-Bu, 11.5, 1.4965, 144, 34.4; iso-Am, 16.5, 1.4920, 134, 36.6; heptyl, 15.0, 1.4869, 125, 39.0; sec-octyl, 18.0, 1.4820, 121, 39.6; benzyl, 18.5, 1.5696, 192, 29.6; PhCH<sub>2</sub>CH<sub>2</sub>, 16.5, 1.5596, 183, 30.5; cyclohexyl, 12.5, 1.5218, 144, 36.2;

2-methylcyclohexyl, 17.0, 1.5093, 134, 37.9; 4-methylcyclohexyl, 17.0, 1.5090, 134, 37.8; menthyl, 16.5, 1.5079, 126.4, 40.1;

L4 ANSWER 42 OF 42 CAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1944:24596 CAPLUS

DOCUMENT NUMBER: 38:24596

ORIGINAL REFERENCE NO.: 38:3566g-1,3567a

TITLE: Analytical procedures employing the Karl Fischer reagent. X. The determination of aliphatic hydroxy amines (amino alcohols)

AUTHOR(S): Smith, Donald Milton; Mitchell, J., Jr.; Hawkins, Walter

SOURCE: Journal of the American Chemical Society (1944), 66, 715-16

CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

OTHER SOURCE(S): CASREACT 38:24596

AB cf. C. A. 36, 366.3. The esterifications procedure (cf. C. A. 34, 1276.2) employing BF<sub>3</sub> as the esterification catalyst is extended to include hydroxy amines. As in the previous case the water liberated in the above reaction, which is equivalent to the hydroxyl esterified, is determined by direct titration with Karl Fischer reagent. Since the reaction of the amine group with the acid or boron trifluoride does not involve water, no interference is encountered. The new procedure is applicable to aliphatic mono- and polyhydric hydroxy amines in general, including branched-chain types and such aromatic hydroxy amines as have the hydroxyl group attached to an aliphatic side chain. The method is applicable also to the determination of hydroxyl in the presence of ammonia

or amines. Amino phenols, however, do not react completely. Anal. data testing this method are tabulated for: monoethanolamine, diethanolamine, triethanolamine, diisopropanolamine, triisopropanolamine, 2-amino-2-methyl-1-propanol, hydroxyethylethylenediamine, 2-amino-2-methyl-1,3-propanediol, 2-amino-2-ethyl-1,3-propanediol, 2-amino-1-butanol, tris(hydroxymethyl)aminomethane, ethylphenylethanolamine, Et orthoformate, Me orthoacetate, Me orthopropionate, Me orthobutyrate and Me orthovalerate. Orthoesters react quant. with the AcOH in the esterification reagent.

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FILE 'CAPLUS' ENTERED AT 13:08:55 ON 09 DEC 2008

L1 44 S (DIRECT) (L) ESTERIF? (L) (PENTAERYTHRITOL OR PROPANEDIOL)  
L2 2 S L1 AND (INERT) (3W) GAS)

FILE 'STNGUIDE' ENTERED AT 13:11:36 ON 09 DEC 2008

L3 0 S L1 NOT L2

FILE 'CAPLUS' ENTERED AT 13:13:51 ON 09 DEC 2008

L4 42 S L1 NOT L2

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